



# CENTER LINE

A Publication of Waukesha County's Retzer Nature Center

## Fall 2011

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- ♦ Apple Harvest Festival, sponsored by AppleTree Credit Union
- ♦ Bird Seed Sale
- ♦ Friends of Retzer Photo Contest Reception

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## BETWEEN ROCK AND A HARD SPACE

Growing up in Bay View during the Great Depression wasn't depressing at all. Kids on our block played seasonal games. We went swimming in Lake Michigan during warm summer afternoons, and belly flopping on our sled during icy winters. Best of all, we went hunting for treasures in the empty lots and woods of our south side neighborhood. To this day, treasure hunting is a passion that remains from childhood.

Childhood treasures were pretty pebbles from the beach, smooth pieces of colored glass washed by the waves, brightly colored leaves of fall, or pieces of old wood that had amusing shapes. At times feathers from birds were treasures that needed to be identified. On this particular day a large rock was spotted in the garden. Picking it up, brushing dirt from its underside, the discovery was made. Something was stuck in its surface. A real treasure-maybe. But what was it? Who knew! Not friends, parents, nor neighbors. Older folks said it was a fossil of some kind. Not much of an answer to constant questioning. So what happened to that fossil? It was dumped back into the garden and later forgotten. Much later in fact, it was my sixtieth year, the answer to my childhood question was finally discovered.



On April 2, of 1986, Governor Anthony Earl signed a bill that paid tribute to *Calymene celebra*—Wisconsin's official state fossil. *Calymene celebra*, the new official state fossil, turned out to be a trilobite (pronounced "Try-lo-bite"). My small treasure proved to be older than the hills. It was the oldest arthropod to be found as a fossil. When looking at its photo, the critter that has been stuck in my rock treasure came into view again. Now was the time to find out about an old treasure, even though it was lost in the past.

The word trilobite comes from Greek words meaning "three lobes". The middle parts of the animal's bodies are divided into 3 sections called lobes. As with all arthropods, it has no back bone, but its limbs do have joints. Instead of bones, arthropods have a hard covering that helps to protect the organs. This protection is called exoskeleton. The creature's body consists of 3 main parts. The head part is called the cephalon; the middle section is the thorax; and last but not least, is the tail part or pygidium. When one finds a trilobite fossil, the remains are not of the organs, antennae, or legs, but of the exoskeleton. An interesting fact about the trilobites: they are the oldest animals to have had eyes. Some of the trilobites had hundreds of lenses in each eye. Some had thousands. With equipment like that, they could not have missed much in their ocean floor environment.

Like arthropods of today, trilobites had to shed their exoskeletons to grow. When arthropods grow, they become packed inside their hard body covering. Finally something's got to give. The exoskeleton has to crack apart, and let the little guys grow up. The exoskeleton usually cracks apart at weak lines on the cephalon. The trilobite could then struggle out of his covers. The process is called molting. After molting, new

(Rock and Hard Space... continued)

covering will be soft. With time however, it will harden into a new and bigger exoskeleton. A bigger and better armored vehicle. The oldest model trilobite could be out and about in his ancient element.

When considering the trilobite's element, a short geological time measure must be brought into view. A framework to aging in reverse.

The Cambrian Period: 540 million to 505 million years ago. The earliest trilobites appear in this period.

The Ordovician Period: 505 million to 440 million years ago. Marine life becomes more diversified, and the first land plants appear.

Silurian Period: 440 million to 410 million years ago. Glaciers melted, sea levels rose, and climate became more stable.

Devonian Period: 410 million to 360 million years ago. Plants diversify, trees and forests appear, and the first land-living vertebrates and insects show up on the scene.

Paleozoic rocks from these 4 periods are found in Wisconsin, and trilobite fossils have been discovered in all four sections. Milwaukee is in a Devonian rock area, so my treasure find in childhood may have been 360 million to 410 million years old. Now there's a rock of ages to be reckoned with!

Trilobites were already extinct when the first dinosaurs existed on earth, but the little lobites has a good run in life. The species survived for 3 million years. Paleontologists think that since the critters were arthropods, they probably laid eggs to archive this longevity, but whatever they did, it worked for them. Trilobite fossils are found all over the world and there are hundreds of shapes and sizes. A fossil found in North Africa had eyes that stuck up like small towers, and the peepers had enough lenses that trilobite could see front, back and all sides in between. Some trilobites developed sharp spines on their bodies for perfect defense. When it came to defense the trilobite had his own system. They had an "enrollment" in the system. Trilobites enrolled whenever they sensed danger. The arthropod would bend over until its pygidium and cephalon met, making a hard ball with its legs, gills, and organs tucked safely inside. The body became a hard ball of exoskeleton. It reminds one of the tiny pill bugs.

Some entertaining history concerning an old fossil:

1. Jewelry, of folks who lived in France thousands of years ago, was made of trilobite fossils.
2. A trilobite of large size probably had molted more than 20 times before fully grown.
3. Some trilobites had eye stalks, and resembled snails.
4. There are more than 200 different trilobite species found in Wisconsin.
5. Naturalist Increase A. Lapham collected Wisconsin trilobites in the 1830s.

If I had known then what I know now, the *Calymene celebra* fossil would have been placed in a soft and safe spot. More information that was accumulating made the artifact even more interesting, and I often wondered what had become of my childhood treasure. How strange the nature of things is passed along the trails.

Looking at a map of Wisconsin's Paleozoic zones, I see Retzer Nature Center is built on Silurian rock—rocks of 440 million to 410 million years of age. If you're tramping on Retzer trails, and find a rock in a depression – stop and turn it over. You may find a trilobite treasure, caught between a rock and a hard space!

See you on the trail,

*Shirley Blanchard*

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# HEARTWOOD



## THE MIDSUMMER FIELD— WHAT IMAGES RETURN

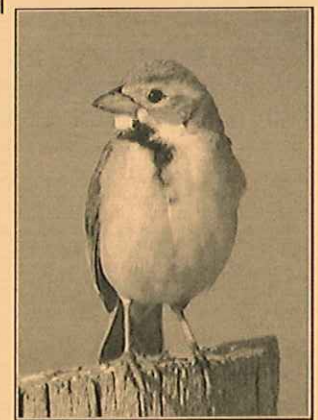
As I write this, we are closing in on Midsummer's Day, June 21st, the Summer Solstice. The southeast hayfield is growing long, and the grasses move eye-high in the summer wind like waves on a coppery-green sea. Out in the field, Barn Swallows jet darkly along, just above the waves, vacuuming up midges and gnats; Tree Swallows sweep acrobatically higher, this way and that way; every so often a lone Cliff Swallow, marked with tan and very fast, makes its speedy way through the swooping scene. Male Bobolinks wheel and turn above the grasses, patrolling their territories and singing their exuberantly agitated song as they eye me with suspicion; female Bobolinks rise from their unseen ground nests, to perch on bending grass stems very near me and voice their strong displeasure (in menacing tones) at my intrusion. Meadowlarks whistle and chatter from their sentry trees around the field edge. Savanna Sparrows glean seeds and insects from the short-cut path and then fly off to feed their unseen nest-bound young, deep in the grass, after which they perch on a stalk and give their insect trill of a territorial song ('tic-tic-tsee-tsay'). Cumulus clouds sail along overhead, growing tall and ponderous through the hot afternoon.

I come out here on my weekly round of trail checks, to see the birds of summer in their habitat—and to appreciate the overall progress of land management that has been many years in the making. In the forty years since cows were pastured in this field, the character of the entire surrounding ecosystem (and its bird life) has changed. The hard edges of field and forest have been blurred and softened, allowing communities to blend one into another. The postage stamp regularity of fields (and fields becoming brushlands) has been opened up, allowing the eventual realization of over sixty acres of contiguous grassland; with this has come the re-settlement of the birds of the summer prairie, who recognize their ancestral home when they see it. In addition to those named above, this field hosts Horned Larks, Vesper Sparrows, Wild Turkeys, the occasional Harrier, and the very occasional Upland Sandpiper. The threatened Henslow's Sparrow (Wisconsin's grassland bird species of greatest concern) makes its home in this field, and (at least in some years) it nests here. In this particular year of 2011, we welcome yet another denizen of prairies past—the incomparable Dickcissel—which (after only occasional and transient appearances in years past) is nesting in the field this year, at last.



Henslow's Sparrow

The Dickcissel is a chunky, self-assured-looking little bird (I think it looks like the little guy in school that nobody messed with, whom the bullies left alone). Of uncertain taxonomic relationship, it is either a finch, or a small member of the blackbird family. About 6 inches in length, the bird has chestnut brown patches on its upper wings, a yellow chest, and a yellow eyestripe, all against a grey background; the male complements all this with a striking black 'V' under its throat, looking a bit like a miniature Meadowlark. The odd name 'Dickcissel' comes from the male's song, which translates 'dik-dik-ciss-ciss-ciss', a grasshopper-like offering that is consistent with the insect-sounding songs of many prairie bird species. The Dickcissel's beak, large and stout for a small bird, is well-suited to the insect-and-seed diet it gleans from its home prairies and fields. Somewhat uniquely, over half the food given to the young turns out to be seeds (as compared with the insect diet that most birds feed to their young).



Dickcissel

Listed by the State of Wisconsin as a species of 'special concern' (a sad honor that it shares with over 25 other grassland bird species), the Dickcissel returns in spring from the Pacific coast grasslands of Mexico, Central America, and northern South America, coming back to the long-grass prairie region of North America. The female builds a bulky nest of grass,

leaves, and stalks near the ground, and four or five blue eggs are laid in this nest; the female incubates them (for just less than 2 weeks), and cares for the young birds till they are old enough to fly (another 2 weeks after hatching). The male (who may be 'polygynous', breeding with more than one female) does not share in any of the care for the young, but patrols the boundaries of the 2-3 acre territory, singing his eponymous song in a purposeful manner.

Alas, the Dickcissel is a bird of vulnerabilities.

\*\*A frequent host to the brood-parasitizing Brown-headed Cowbird (which lays its eggs in the nests of other birds), the Dickcissel is apparently unable to recognize that baby Cowbirds are not its own, and the mother therefore feeds and cares for them—which reduces the survival chances of its own young.

\*\*Nesting during the time of the year's first hay-cutting, the Dickcissel is prone to nest destruction (and destruction of young) by hay mowers, before the young are mature enough to fly out of the way.

[Note that we delay our hayfield mowing until July 15th or after, giving the young Dickcissels sufficient time to mature, and to avoid the hay mower.]

\*\*After migrating southward following the breeding season, Dickcissels form huge flocks on their wintering range (especially in South America)—and grain farmers view them as an agricultural pest, because of the amount of grain they eat (resulting in measures not in the interest of Dickcissel survival)

These vulnerabilities, along with loss of grassland habitat and changing land use practices, are no doubt responsible for a population decline of Dickcissels, and for their 'special concern' status.

All the happier we are to see them!

All the more significant and important that our land management at Retzer is designed to restore and re-claim the open grassland and savanna communities seen here in pre-settlement times, in which birds such as the Dickcissel can thrive!

The midsummer field—what images return.

*Larry*

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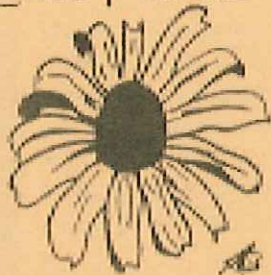
*A Sincere Thanks to...*

*Benjamin F. Goss Bird Club for a cash donation and  
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*Their support is greatly appreciated.*

# The Last Prairie

## Together Forever



In this world, there always seem to be things we cannot live without. Some are basic essentials and well-known, like food and water. Others are less-tangible and a little more difficult to explain (or justify) like cookies, smart phones, ketchup, vehicles, pizza, binoculars, and definitely coffee. When you 'need' another life form, it is called a relationship. Anything works in this equation, but the best ones are interactive, with both sides profiting. I hope none of you are strangers to mutually beneficial relationships, but what happens if you truly need another to survive? If it is an actual requirement for survival on both sides, a relationship takes on a whole new meaning. Some of you may even fully realize this meaning. It certainly exists in the natural world, and you probably already know about **symbiosis** (where two or more species live together in direct contact—often for long periods of time). It is an ecological term that 'catches' a lot of relationships. Yes, even parasitism fits into symbiosis. In all ecological technicality, there are four subcategories of symbiotic association: 1) **Commensalism**—where one species benefits, and the other is unharmed, but also does not benefit. 2) **Parasitism**—where one species benefits, and the other is harmed. 3) **Competition**—all involved species are harmed. 4) **Mutualism**—all species benefit (Pratt 1995).

Luckily, we can take a positive turn as we explore Lichens; they employ mutualism, and all organisms involved are happy enough. 'All organisms' include three main roommates. Most of us already knew about the two most famous players. On one side, there is a fungus, and it is really good at constructing a weird-looking shelter. At the same time, it is really bad at creating its own food. On another side, there is an alga, and it is top-notch with food production, but simultaneously lousy protecting itself on a barren rock. Together, they form of one super organism worthy of an after-school anime series. But few speak of the lesser known third party. There is another contributor on the production front in the form of a **cyanobacterium** (obtains energy through photosynthesis). Just how they produce food is another article, but it is similar and concurrently vastly different than the methods found in plants. What we know is that there is always at least one consumer (mycobiont or fungi) and one producer (photobiont or algae and bacteria), but sometimes all three are present (Walewski 2007).

The profits are not quite 'even across the board'. It would be nice to believe in lichen equality, but the true story is that fungi are the biggest beneficiaries of the bunch. In fact,

lichens are even taxonomically placed in the Kingdom Fungi. There are a few reasons for this decision. All the associated species of algae and cyanobacteria can exist on their own, but you will not find any of the fungi living solo in nature. The wavy, flowing, fungal structure also governs the shape and usually supplies most of the biomass. Finally, the same algae and bacteria can exist in different species of fungi. So, we lump lichens with toadstools and everyone is happy, or perhaps some are only barely content. With taxonomists, it is never simple. Some argue that we are not dealing with organisms, but micro ecosystems. North American lichenologist Trevor Goward speaks of the relationship "a fungus that has discovered agriculture". This is much more grandiose than in the eighteenth century, when Carl Linnaeus called lichens the "poor trash of vegetation" (Walewski 2007) and lumped them all into one genus (now expanded into hundreds). In Linnaeus' defense, no one discovered that these fungi were actually **symbionts** until the mid-nineteenth century. In any case, our father of vegetative nomenclature did not think much of these tiny biota, but we are certainly giving them the once-over today.

Hence, let us take a closer look at these tiny titans. Whatever category you wish to pitch them into, these cops definitely exist, and they exist within many climates and communities. The cooperation of these organisms makes for extremely hardy little lichens. They grow in a variety of harsh conditions from desert furnaces achieving 50° C, to the arctic circle falling to a frigid -50° C, and everywhere in between (Barron 1999). They also thrive on some very interesting **substrates**, or surfaces they inhabit. They live on the forest floor, tree bark (and yes, for the northern hemisphere, lichens do tend towards the north side of trees—but do not count on this if you are lost!), and rock; human-made rock also seems to suffice. These substrates are more for anchoring points in suitable climate conditions, as they rarely provide nutrients that interest lichens. They just sort of 'hang out' where they are growing, actually gathering nutrients out of thin air, and waiting for it to rain. The **thallus** (main body of the lichen) has the capability to partially dry-out, becoming opaque to protect the tiny bacteria and algae. After the rain, the lichen changes drastically in a few minutes, growing in size and even changing color in some cases. Some believe this transitional phase is key to nutrient exchange (Walewski 2007). It certainly makes lichens even more interesting, not to mention (once again) tough. Their self-sustaining independence makes them the stuff of legend in the natural world.

By contrast, the same resilient creatures wimp-out when it comes to unclean air. They take in chemicals from not only the air, but the water. When you gather your life-giving water solely from rain, you end up absorbing whatever toxic ingredients it carries. They will take in

continued on next page

toxins to the point of death (Primack 1993). They often disappear within city limits, gradually increasing in number proportionate to the distance from high-density human civilization. Some lichens can withstand pollution. Knowing which ones are sensitive to impurities helps us gauge our effect on nature. Some scientists use expensive equipment to detect heavy pollutants, some just use lichens. They are nature's environmental monitoring devices, although it would be preferable if we did not use them this way, and just kept the air clean.



Before our article is at an end, what lichens are growing around here? Luckily the oak forest biota have received some special attention and study. We are not as diverse as the forests in the northern half of the state, and the very northern boreal areas have the most species (try out Isle Royale for over 600 different types). The trees in the northern regions are slow-growing and long-lived, allowing anything that grows on them a good, long time to reach their full potential (Hoffman 2002). There are enough here to get you started if you are willing to look. I apologize for the lack of common names. The internet can help with some pictures, but most just do not have names in plain English. The following, less than comprehensive list, is from Curtis (1971).

**Southern Mesic (Maple/Basswood) Forest:** *Arthonia radiata*—occasional, *Graphis scripta*—common, *Physcia orbicularis*—occasional

**Southern Dry (Black/White/Red Oak, Shagbark Hickory) Forest:** Mostly, only genera are listed, and all listed are common. *Allarthonia spp*, *Buellia spp*, *Candelaria spp*, *Leconora spp*, *Parmelia rudecta*, *Physcia spp*, *Ramalina spp*, *Rinodian spp*.

**Sand Barrens (sandy soil sites in general for us, usually open):** *Cladonia cristatella* or British Soldiers is a relatively common fruticose species in the normal part of the state. It is definitely not common here, but at least you got a common name out of it.

If you are still unsettled by lichens, do not fret. These leafy, flaky, and lungworty life-forms still present an enigma even to the pros. If you go outside and look on these minute self-contained farming communities with new interest, you are already doing as well as any of us.

*Mike*

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## A Face-Lift for Retzer

As you enjoy the natural surroundings of Retzer Nature Center, you may see more than the normal seasonal changes happening around you.

The Maintenance Building is complete, which houses the land management equipment, the native seed and plant room, and restroom facilities that are open from sunrise to 10 p.m. to coincide with the Nature Center hours.

The Geothermal Heating and Cooling System project is now on-line, which is the first project of this kind for Waukesha County. Geothermal energy is the heat from the Earth. It's clean and sustainable. Geothermal energy is heat (thermal) derived from the earth (geo). It is the thermal energy contained in the rock and fluid (that fills the fractures and pores within the rock) in the earth's crust. Ground-source heat pumps use the earth or groundwater as a heat source in winter and a heat sink in summer.

The dredging of our Teaching Pond will begin soon. You may have noticed the water level getting lower the last few years, so with the renovations, the pond should be able to retain a better water level. The contractors will pump out the existing water downstream in order to begin work. No animals will be affected by the work, as they will find other water sources once the pond is empty. And as the water comes back, those animals will find their way back. The dam structure that is currently at the pond will be removed and replaced with a fieldstone outlet. A bridge will be built over the outlet for the students who visit the teaching pond. The Friends of Retzer have taken an active role in getting this project underway.



Photo of Retzer's Teaching Pond, taken in 2009.

The Prairie Underground exhibit will be receiving some new guests. As the root systems get changed out, some taxidermy mounts of native soil-zone animals will be moving in. The new Underground will depict the animals in their natural den setting, underground. Scott Zoellick, a well-known Wisconsin wildlife artist, will be painting the mural for the exhibit.

All of these improvements help Retzer Nature Center in the teaching of the local land system while helping create a personal connection to nature.

Up-coming events...

**Waukesha County  
Park System**

**Retzer  
Nature  
Center**

**Fall Plant Sale  
at Retzer Nature Center**  
**Saturday, August 20**  
**9 am to Noon**

Big and Little Bluestem Grass ♦ Indian Grass ♦ Prairie Violet  
Wild Lupine ♦ Butterfly-weed ♦ Wild Geranium  
New England Aster ♦ Prairie Blazing Star ♦ and more...

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### **Friends of Retzer Nature Center**

The Friends of Retzer Nature Center is a registered, 501 (c)3, organization dedicated to encouraging, perpetuating, and promoting the work of conservation and natural resource education.

The organization seeks the involvement of the community in the form of financial and volunteer support to work toward the continued growth and improvement of Retzer Nature Center. If you would like to become a member or view some of our projects and activities, please visit our web site at <http://FriendsOfRetzer.org>.